

**REMARKS**

This is a full and timely response to the outstanding nonfinal Office Action mailed August 29, 2003. Reconsideration and allowance of the application and presently pending claims, as amended, are respectfully requested.

**Present Status of Patent Application**

Upon entry of the amendments in this response, claims 1-33 remain pending in the present application. More specifically, claims 1, 2, 13-15, and 26-27 are directly amended. These amendments are specifically described hereinafter. It is believed that the foregoing amendments add no new matter to the present application.

**Miscellaneous Issues**

The drawings have been objected to, and the Office has stated that "the features of claims 13, 26, and 27 must be shown...." New FIG. 4 has been added to the application to show the method steps of claims 13, 26, and 27. No new matter has been entered, as support for these steps can be clearly found in the originally-filed claims and the Detailed Description section of the patent application. The specification has also been amended to reflect the addition of the new figure.

**Response To Rejections****Response To Claim Rejections Under 35 U.S.C. Section 112, Second Paragraph**

Claims 1-33 have been rejected under 35 U.S.C. 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. In particular, the Office Action asserts the following:

Claim 1 - the claim is vague in that it is unclear how one fiber can be integrated and the lead is chosen from one of plural fibers Claim 2 - "the fiber" lacks a clear antecedent Claims 5 and 6 positively limit the connector; however, claim 1 fails to include the connector as a positive element of the sensor Thus, it is vague as to whether the connector is indeed an element of the combination Claims 9-13 are vague since the lead has not been positively connected to the connector Claim 13 is vague as to how the sensor cooperates with the fiber sensing component of the

liner or if they are one and the same element Claims 14, 15, 20, 21, and 24-31 are rejected for similar reasons as claims 1, 2, 5, 6, and 9-13, *supra*. In addition, claims 26 and 27 fail to include any monitoring step

*Office Action* at 2. Applicants respectfully traverse, but have nevertheless amended the claim to further prosecution. Each of the above-referenced rejections has been addressed by amendments to the claims. It is believed that each of the rejections has either been accommodated and/or rendered moot based on the claim amendments set forth herein.

Applicant wishes to clarify that the amendments based on this rejection are cosmetic in nature and are not made as a condition for obtaining a patent. Applicant further submits that these amendments are non-narrowing and, pursuant to *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 122 S. Ct. 1831 (2002), no prosecution history estoppel arises from these amendments.

Response To Claim Rejections Under 35 U.S.C. Section 102

Claims 1, 9, 13, 14, 24, and 26 have been rejected under 35 U.S.C. Section 102(b) as allegedly anticipated by *Kelly et al.* (U.S. Pat. No. 5,507,296). Applicants respectfully traverse. For a proper rejection of a claim under 35 U.S.C. Section 102(b), the cited reference must disclose all elements/features/steps of the claim. See, e.g., *F.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 7 USPQ2d 1129 (Fed. Cir. 1988). *Kelly et al.* do not show each of the features/steps of the rejected claims.

Independent claims 1 and 14 recite in part:

a knitted or woven [fully-, claim 1] conductive fabric including one or more individually conductive fibers integrated therein by the process for knitting or weaving the fabric, each conductive fiber being individually conductive prior to incorporation into the fabric in the absence of a conductive coating applied to the fabric or to the fibers....

*Claims 1 and 14.* Independent claims 1 and 14 are allowable for at least the reason that *Kelly et al.* do not disclose, teach, or suggest the features that are excerpted from claims 1 and 14 above. More specifically, quoting from portion of *Kelly et al.* cited by the Office, *Kelly et al.* discloses that, "a single wire or a multiplicity of fine wires may be adhered onto the hib by a non-conductive adhesive in the desired pattern." *Kelly et al.* at col. 5, lines 35-38 (emphasis added).

Thus, *Kelly et al.* does not anticipate claims 1 and 14, and the rejection should be withdrawn.

If independent claims 1 and 14 are allowable over the prior art of record, then their dependent claims 9, 13, 24, and 26 are allowable as a matter of law, because these dependent claims contain all features/elements/steps of their respective independent claims. *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). Additionally and notwithstanding the foregoing reasons for the allowability of claims 1 and 14, these dependent claims recite further features/steps and/or combinations of features/steps (as is apparent by examination of the claims themselves) that are patentably distinct from the prior art of record. Hence, there are also other reasons why these dependent claims are allowable.

Response To Claim Rejections Under 35 U.S.C. Section 103

(a) Claims 1-8, 11, 12, 14-23, and 28-33 have been rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over *Collins et al.* (U.S. Patent No. 710,429) in view of *Flick* (U.S. Patent No. 5,374,283). The Office asserts that:

*Collins et al.* clearly disclose the fabric-based sensor (see page 1, line 100 to page 2, line 7). The reference fails to disclose the electrical lead from the conductive fabric as being one of the fibers of the fabric. *Flick* clearly discloses a similar fabric sensor wherein one of fibers can be the electrical lead (see Figure 4). Given this teaching, it would have been obvious to use one of the fibers of the fabric in *Collins et al.* as the lead to better integrate the structure.

In addition, the use of a snap connector is taught by *Flick* and the use of conductive paste to secure leads and connectors is notoriously well known in the art. Accordingly, the use of these features in the combination to secure the fiber to a connector would have been obvious design expedients to the skilled artisan to ensure the connection of the elements.

*Office Action* at 3. Applicants respectfully traverse.

**1. There is No Motivation to Combine *Collins et al.* with *Flick***

In order to establish the *prima facie* case of obviousness, the Examiner must establish a suggestion or motivation either in the references themselves, or in the knowledge generally available to one of ordinary skill in the art to modify the reference or combine reference

teachings in order to result in the claimed invention. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). In the present case, the *prima facie* case of obviousness has not been established because there is no suggestion or motivation in the art to combine *Collins et al.* with *Flick*.

Additionally, the Office cannot pick and choose among isolated disclosures in the prior art with the invention in mind. This is impermissible hindsight reconstruction, and is also further evidence of a lack of suggestion or motivation to combine the references. *In re Fine* at 1075.

Here, the Office has chosen among isolated disclosures in different arts in order to find all of the elements found in the present invention. *Collins et al.* is related to "appliances for the purpose of applying electric current to the different parts of the body for the purpose of stimulating the circulation of the blood and maintaining the parts at their normal temperature." *Collins et al.* at col. 1, lines 9-14. *Flick* is related to the discovery that a "non-conductive fabric with a metallic coating may over substantial periods of time be used in the treatment of pain and edema..." *Flick* at col. 1, lines 64-66. *Flick* is an isolated disclosure in a different art. Thus, this is impermissible hindsight reconstruction and proves that there was no suggestion or motivation in these references to combine them.

As noted previously, the Office "cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies." *In re Lee* at 1345. The specific teaching that would have suggested the claimed combination must be present, and subjective belief could not be relied on. Here, the Office has made just such a subjective conclusory statement that "the use of these features in the combination to secure the fiber to a connector would have been obvious design expedients to the skilled artisan..." *Office Action* at 3. The Office does not show where there is any motivation in the references themselves for combining them. For at least the reason that there is no motivation provided for combining the references, no *prima facie* case of obviousness has been established for each of the claims, the rejection of claims 1-8, 11, 12, 14-23, and 28-33 should be withdrawn.

**2. The Combination of *Collins et al.* and *Flick* Does Not Render Obvious the Present Claimed Invention**

It is well established at law that, for a proper rejection of a claim under 35 U.S.C. §103 as being obvious based upon a combination of references, the cited combination of references must

disclose, teach, or suggest, either implicitly or explicitly, all elements/features/steps of the claim at issue. See, e.g., *In re Dow Chem.*, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988) and *In re Keller*, 208 USPQ 871, 881 (CCPA 1981). The combination of *Collins et al.* in view of *Flick* fails to establish a *prima facie* case of obviousness.

*Collins et al.* teaches that its "garment *h* is provided with a number of disconnected conducting – surfaces...." *Collins et al.* at col. 2, lines 100-103. At least the features of claims 1 and 14 of "(a) a [fully, claim 1] conductive knitted or woven fabric including one or more individually conductive fibers integrated therein by the process for knitting or weaving the fabric...; (b) an electrical lead for connection to a connector...; and (c) a connector connected to the electrical lead" are not taught or suggested by *Collins et al.*

This deficiency of *Collins et al.* is not remedied by *Flick*. *Flick* teaches the use of nylon fibers. *Flick* further teaches that to obtain conductivity in its apparatus, a metalized coating must be applied to the fabric. Thus, the nylon fibers per se in *Flick* are not individually conductive prior to incorporation into the fabric. It is the metalized coating applied to the fabric that is conductive. This is further supported by the fact that nylon is a compound which is known to have good electrical resistance. Consequently, the combination of *Collins et al.* in view of *Flick* does not render claims 1 and 14 obvious, and the rejection should be withdrawn.

If independent claims 1 and 14 are allowable over the prior art of record, then their dependent claims 2-8, 11, 12, 15-23, and 28-33 are also allowable as a matter of law, because these dependent claims contain all features/elements/steps of their respective independent claims. Additionally and notwithstanding the foregoing reasons for the allowability of claims 1 and 14, these dependent claims recite further features/steps and/or combinations of features/steps (as is apparent by examination of the claims themselves) that are patentably distinct from the prior art of record. Hence, there are also other reasons why these dependent claims are allowable.

(b) Claims 1-6, 9, 10, 13-21, 24-27, 32, and 33 have been rejected under 35 U S C 103(a) as being unpatentable over *Love* (U.S. Patent No. 3,542,010) in view of *Finch* (U.S. Patent No. 4,848,351). The Office asserts that:

Love clearly discloses the fabric-based sensor (see col 1, line 71 - col 2, line 55) The fibers may be impregnated or coated to effect electrical conductivity; however, it is not clear that the impregnation takes place prior to incorporation into the fabric

Finch clearly discloses a similar fabric which can use metal wires as the fiber (see column 2, lines 29-34) in lieu of coated fibers. Accordingly, the use of metal wires in Love would have been an obvious substitute in light of the equivalency teaching of Finch.

*Office Action* at 3-4. Applicants respectfully traverse.

**1. Love and Finch are Non-Analogous References**

Applicants traverse this rejection because the Office has combined non-analogous references. Use of references in a rejection is improper if one of ordinary skill would not have reasonably consulted them and applied their teaching in seeking a solution to the problem addressed by the instant invention. See *Heidelberger Druckmaschinen v. Hantscho Commercial Prods.*, 21 F.3d 1068, 1071, 30 USPQ2d 1377 (Fed. Cir. 1994). This speaks to the fact that the inventor can not possibly be aware of every teaching in every art. See *Application of Wood*, 599 F.2d 1032, 1036, 202 USPQ 171 (CCPA 1979).

The following factors determine whether a reference is analogous: (1) inventor's field; and (2) whether a reference is reasonably pertinent. If the reference is within the field of the inventor's endeavor, then it is analogous. See *In re Oetiker*, 977 F.2d 1443 (Fed. Cir. 1992); *In re Deminski*, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986); *Application of Wood* at 1036. If the reference is reasonably pertinent to the particular problem addressed by the invention, then it is analogous. *Application of Wood* at 1036.

*Love* is directed toward an "electrode assembly [that] is formed of electronically conductive, matted-loop pile carried on a surface of an elongated, flexible fabric strip of a length to encircle a body member for positioning of the pile in electrical contact-forming engagement with the skin surface." *Love* at Abstract. *Love* pertains to a fabric with conductive fibers as "piles" in the fabric. See *Love* at col. 2, *passim*. It is important to note that in a pile fabric, e.g., the one produced by *Love*, there are a large number of yarns projecting almost vertically from the body of the cloth, known as the "pile." This pile is supported by a closely woven "ground" cloth. In *Love*'s Fig. 3, numeral 15 refers to the "base" fabric (termed the "fabric strip" by *Love*), and numeral 16 refers to the pile. As seen in FIG. 3 of *Love*, there is "depth" or extra thickness in the structure, which is unlike a typical fabric used to make a typical garment. An everyday example of a pile fabric is a bath towel.

In contrast, in the present claims, the resulting fabric is not a pile fabric and there are no separate "ground" and "pile" threads. In claims 1 and 14, the fabric is comprised a "knitted or woven" conductive fabric "of one or more integrated individually conductive fibers...." Thus, *Love* is non-analogous art for the presently-claimed invention.

*Finch* is also non-analogous art for similar reasons that *Love* is non-analogous art. *Finch* is directed to an "electrode comprising a top portion having an electrically conductive loops for removably fastening the hook fasteners thereto...." *Finch* at col. 1, lines 51-53. This is clearly non-analogous art for the presently claimed invention. Both prongs are met of the determination that this art is not analogous to the present invention, *i.e.*, it is not within the inventor's field and, especially, it is not reasonably pertinent to the problem addressed by the present invention.

A person skilled in the art of fabricating woven or knitted fabric-based sensors of a fully-conductive fabric and garments that include such fabric-based sensors would not search for solutions to problems in their art in a reference that deals with hook and loop or pile-type fabrics. Because non-analogous references were used to reject claims 1-6, 9, 10, 13-21, 24-27, 32, and 33 of the present application, Applicants respectfully request that this rejection be withdrawn.

## 2. There is No Motivation to Combine *Love* with *Finch*

In the present case, the *prima facie* case of obviousness has not been established because there is no suggestion or motivation in the art to combine *Love* with *Finch*. As noted previously, the Office cannot pick and choose among isolated disclosures in the prior art with the invention in mind. This is impermissible hindsight reconstruction, and is also further evidence of a lack of suggestion or motivation to combine the references. *In re Fine* at 1075.

Here, the Office has chosen among isolated disclosures in different area of the art from the present invention in order to find all of the elements found in the present invention. *Love* is related to a fabric with conductive fibers as "piles" in the fabric. See *Love* at col. 2, *passim*. *Finch* is related to an electrode made of a top portion of hook and loop fasteners and a bottom of electrically conductive adhesive. *Finch* at cols. 1 and 2, *passim*. Thus, this is impermissible hindsight reconstruction and proves that there was no suggestion or motivation in these references to combine them.

As noted previously, the Office "cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies." *In re Lee* at 1345. The specific teaching that would have suggested the claimed combination must be present, and subjective belief could not be relied on. Here, the Office has made just such a subjective conclusory statement that "the use of metal wires in Love would have been an obvious substitute in light of the equivalency teaching of Finch." *Office Action* at 4. The Office does not show where there is any motivation in the references themselves for combining them. For at least the reason that there is no motivation provided for combining the references, no *prima facie* case of obviousness has been established for each of the claims, the rejection of claims 1-6, 9, 10, 13-21, 24-27, 32, and 33 should be withdrawn.

**3. The Combination of *Love* and *Finch* Does Not Render Obvious the Present Claimed Invention**

The combination of *Love* in view of *Finch* fails to establish a *prima facie* case of obviousness. *Love* teaches a pile fabric, as noted above. At least the features of claims 1 and 14 of "(a) a [fully, claim 1] conductive knitted or woven fabric including one or more individually conductive fibers integrated therein by the process for knitting or weaving the fabric...; (b) an electrical lead for connection to a connector...; and (c) a connector connected to the electrical lead" are not taught or suggested by *Love*.

This deficiency of *Love* is not remedied by *Finch*. *Finch* also teaches the use of hook fasteners and conductive loops and fails to teach at least the features noted above of claims 1 and 14. See col. 2, lines 14-16 and *passim*. Moreover, *Finch* requires the use of an "adhesive" in its electrode assembly. See col. 2, lines 17-19. In contrast, claims 1 and 14 recite "each conductive fiber being individually conductive prior to incorporation into the fabric *in the absence of a conductive coating applied to the fabric or to the fibers*." Claims 1 and 14 (emphasis added). Consequently, the combination of *Love* in view of *Finch* does not render claims 1 and 14 obvious, and the rejection should be withdrawn.

If independent claims 1 and 14 are allowable over the prior art of record, then their dependent claims 2-6, 9, 10, 13, 15-21, 24, 27, 32, 33 are also allowable as a matter of law, because these dependent claims contain all features/elements/steps of their respective independent claims. Additionally and notwithstanding the foregoing reasons for the allowability of claims 1 and 14,



these dependent claims recite further features/steps and/or combinations of features/steps (as is apparent by examination of the claims themselves) that are patentably distinct from the prior art of record. Hence, there are also other reasons why these dependent claims are allowable.

(c) Claims 1-10, 13-27, 32, and 33 have been rejected under 35 U S C 103(a) as being unpatentable over Allison (U.S. Patent No. 4,016,868) in view of *Flick*. The Office alleges that:

Allison clearly discloses the fabric-based sensor (see column 3, lines 20-27) The reference fails to disclose the electrical lead from the conductive fabric as being one of the fibers of the fabric *Flick* clearly discloses a similar fabric sensor wherein one of fibers can be the electrical lead (see Figure 4) Given this teaching, it would have been obvious to use one of the fibers of the fabric in Allison as the lead to better integrate the structure

*Office Action* at 4. Applicants respectfully traverse.

1. **There is No Motivation to Combine *Allison* with *Flick***

In the present case, the *prima facie* case of obviousness has not been established because there is no suggestion or motivation in the art to combine *Allison* with *Flick*. Here, the Office has chosen among isolated disclosures in different arts in order to attempt to find all of the elements found in the present invention. *Allison* is related to "devices for non-invasively measuring blood flow..., and in particular to a garment to be worn for applying electrodes to a body for impedance plethysmograph measurements." *Allison* at col. 1, lines 7-11. *Flick* is related to the discovery that a "non-conductive fabric with a metallic coating may over substantial periods of time be used in the treatment of pain and edema...." *Flick* at col. 1, lines 64-66. *Flick* is an isolated disclosure in a different art. Thus, this is impermissible hindsight reconstruction and proves that there was no suggestion or motivation in these references to combine them.

Also, the Office has again made a subjective conclusory statement that "it would have been obvious to use one of the fibers of the fabric in Allison as the lead to better integrate the structure." *Office Action* at 4. The Office does not show where there is any motivation in the references themselves for combining them. For at least the reason that there is no motivation provided for combining the references, no *prima facie* case of obviousness has been established for each of the claims, and the rejection of claims 1-10, 13-27, 32, and 33 should be withdrawn.

## 2. The Combination of *Allison* and *Flick* Does Not Render Obvious the Present Claimed Invention

The combination of *Allison* in view of *Flick* fails to establish a *prima facie* case of obviousness. *Allison* uses "strips" or "patches" of conductive materials that are attached to the elastic base fabric when the *garment* is manufactured. See *Allison* at col. 3, lines 24-25. Additionally, *Allison* appears to be stitching the conductive strips during *garment manufacturing* and not in the fabric stage. This additional observation about *Allison* is supported in FIG. 4 where the strips (47, 49, 27) appear to be "attached" to the base garment. While *Allison* teaches that the "impregnated strips are woven into the garment fabric at the selected intervals as the garment is being manufactured...", the word "woven" as it is known in the art is used incorrectly. A fabric strip cannot be "woven" while a *garment* is being manufactured. Based on the rest of the specification, it is clear that *Allison* is referring instead to *stitching* the fabric strips together with the base fabric during garment manufacturing.

In contrast, in the present independent claims 1 and 14 there is no such "attachment" and it is recited that the conductive portion is integrated during fabric production. Specifically at least the features of claims 1 and 14 of "(a) a [fully, claim 1] conductive knitted or woven fabric including one or more individually conductive fibers integrated therein by the process for knitting or weaving the fabric...; (b) an electrical lead for connection to a connector...; and (c) a connector connected to the electrical lead" are not taught or suggested by *Allison*.

This deficiency of *Allison* is not remedied by *Flick*. *Flick* teaches that to obtain conductivity in its apparatus, a metalized coating must be applied to the fabric. Thus, the nylon fibers per se in *Flick* are not conductive. It is the metalized coating applied to the fabric that is conductive. This is further supported by the fact that nylon is a compound which is known to have good electrical resistance. Consequently, the combination of *Allison* in view of *Flick* does not render claims 1 and 14 obvious, and the rejection should be withdrawn.

If independent claims 1 and 14 are allowable over the prior art of record, then their dependent claims 2-10, 13, 15-27, 32, and 33 are also allowable as a matter of law, because these dependent claims contain all features/elements/steps of their respective independent claims. Additionally and notwithstanding the foregoing reasons for the allowability of claims 1 and 14, these dependent claims recite further features/steps and/or combinations of features/steps (as is

apparent by examination of the claims themselves) that are patentably distinct from the prior art of record. Hence, there are also other reasons why these dependent claims are allowable.

(d) Claims 2, 5, 6, 10, 15, 20, 21, 25, and 27 have been rejected under 35 U S C 103(a) as being unpatentable over Kelly *et al.* (U.S. Patent No. 5,507,290), or alternatively Kelly *et al.* in view of Flick. The Office asserts that:

Kelly fails to disclose the snap connector and the use of conductive paste. The use of a snap connector is taught by Flick and the use of conductive paste to secure leads and connectors is notoriously well known in the art. Accordingly, the use of these features in the combination to secure the fiber to a connector would have been obvious design expedients to the skilled artisan to ensure the connection of the elements.

*Office Action* at 4-5. Applicants respectfully traverse.

#### 1. The Rejected Claims are Dependent Claims

Because independent claims 1 and 14 are allowable over the prior art of record, their dependent claims 2, 5, 6, 10, 15, 20, 21, 25, and 27 are allowable as a matter of law, for at least the reason that these dependent claims contain all features/elements/steps of their respective independent claims 1 and 14. *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). Additionally and notwithstanding the foregoing allowability of these dependent claims, the dependent claims recite further features and/or combinations of features, as is apparent by examination of the claims, that are patentably distinct from the prior art of record. Hence, there are other reasons why these dependent claims are allowable, some of which are outlined below.

#### 2. Kelly or the Combination of Kelly and Flick Does Not Render Obvious the Present Claimed Invention

Kelly makes use of either *printed strips* of fabric or wires *mounted on* said sheet to realize the invention. For example, Kelly states that "[a]lternatively, a single wire or a multiplicity of fine wires may be *adhered onto the bib by a non-conductive adhesive* in the desired pattern." Kelly at col. 5, lines 36-38 (emphasis added). In contrast, for example, claims 2 and 15 recite "a conductive paste between the individually conductive fiber and the connector," which is not taught or suggested by Kelly.

This deficiency of *Kelly* is not remedied by *Flick*. *Flick* teaches that to obtain conductivity in its apparatus, a metalized coating must be applied to the fabric. Thus, the nylon fibers per se in *Flick* are not individually conductive, as recited in claims 2 and 15. It is the metalized coating on the fabric of *Flick* that is conductive. Consequently, for at least these reasons as well, the combination of *Kelly* in view of *Flick* does not render claims 2 and 15 obvious, and the rejection should be withdrawn.

Prior Art Made of Record

The prior art made of record has been considered, but is not believed to affect the patentability of the presently pending claims.

**CONCLUSION**

In light of the foregoing amendments and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that the now pending claims 1-33 are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephone conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

Respectfully submitted,

  
Cynthia J. Lee, Reg. No. 46,033

**THOMAS, KAYDEN,  
HORSTEMEYER & RISLEY, L.L.P.**  
Suite 1750  
100 Galleria Parkway N.W.  
Atlanta, Georgia 30339  
(770) 933-9500